

Appln No. 10/072,807
Amdt date November 13, 2003
Reply to Office action of May 15, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An apparatus for transferring at least one part to be deposited on an ~~immobilised~~ immobilized pallet, ~~characterised in that it comprises comprising:~~
a transporter (42) equipped with a gripping device (50) and adapted to grasp the at least one part (38) on a distributor (40), displace it from the distributor and deposit it in a positioning tool; (54), and
a manipulator (60) equipped with a gripper (62) and adapted to grasp the at least one part in a precise position in the positioning tool (54), displace it from the positioning tool and deposit it in a precise position in a positioning receptacle (64) carried by the immobilized pallet (12).

2. (Currently Amended) An apparatus as set forth in claim 1 ~~characterised in that wherein~~ the distributor (40) and the positioning tool (54) are disposed at adjacent first vertical levels, ~~(N1, N2)~~ while the positioning receptacle (64) carried by the immobilized pallet is disposed at a second vertical level, ~~(N3)~~ below the first vertical level ~~(N2)~~ of the positioning tool (54).

3. (Currently Amended) An apparatus as set forth in claim 1 or 2 ~~characterised in that wherein~~ the transporter (42)

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comprises a mechanism ~~(22, 45, 44)~~ involving having crossed movements, which is adapted to provide pilot-control of a carriage ~~(46)~~ in two mutually perpendicular horizontal directions ~~(F1, F2)~~, and wherein the carriage ~~(46)~~ carries a vertical actuator ~~(48)~~ which supports the gripping device of the transporter (50).

3/ 4. (Currently Amended) An apparatus as set forth in claim 1 ~~characterised in that~~ wherein the ~~gripper (50)~~ gripping device of the transporter comprises two movable jaws ~~(52)~~ adapted to be moved towards each other to grasp the at least one part ~~(38)~~ on the distributor ~~(40)~~ and to be moved away from each other to deposit ~~it~~ the at least one part in the positioning tool ~~(64)~~.

5. (Currently Amended) An apparatus as set forth in claim 1 ~~characterised in that~~ wherein the manipulator ~~(60)~~ comprises an actuator ~~(66)~~ involving which carries and vertically displaces ~~vertical displacement, which carries~~ a support arm ~~(68)~~ that is adapted to horizontally pivot over a limited angular range of selected value, and wherein the support arm ~~(68)~~ supports the gripper of the manipulator (62) to permit the ~~latter~~ gripper of the manipulator to be displaced by a combined movement of horizontal rotation and vertical translation.

6. (Currently Amended) An apparatus for transferring at least one part to be deposited on an immobilized pallet, comprising:

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a transporter equipped with a gripping device and adapted to grasp the at least one part on a distributor, displace it from the distributor and deposit it in a positioning tool; and

a manipulator equipped with a gripper and adapted to grasp the at least one part in a precise position in the positioning tool, displace it from the positioning tool and deposit it in a precise position in a positioning receptacle carried by the immobilized pallet, wherein the manipulator comprises an actuator which carries and vertically displaces a support arm that is adapted to horizontally pivot over a limited angular range of selected value, and wherein the support arm supports the gripper of the manipulator to permit the gripper of the manipulator to be displaced by a combined movement of horizontal rotation and vertical translation ~~Apparatus as set forth in claim 5 characterised in that~~ and wherein the manipulator (60) is connected to operational control means for effecting the following sequence of operations:

moving the gripper of the manipulator (62) above the positioning tool; ~~(54);~~

actuating the gripper of the manipulator (62) to pick up the at least one part (38) in said positioning tool; ~~(54);~~

pivoting the support arm (68) over said angular range; ~~;~~

displacing the support arm (68) vertically without a change to its angular orientation to move the gripper of the manipulator (62) above the positioning receptacle (64) carried by the immobilized pallet; ~~;~~

actuating the gripper of the manipulator (62) to deposit the at least one part in said positioning receptacle; ~~(64) and~~

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moving the gripper again above the positioning tool (54) for a fresh sequence of operations.

7. (Currently Amended) Apparatus as set forth in claim 5 or 6 ~~characterised in that~~ wherein said limited angular range ~~corresponds to~~ is approximately 180°.

8. (Currently Amended) Apparatus as set forth in claim 5 ~~characterised in that~~ wherein the gripper of the manipulator (62) comprises two movable jaws (70) adapted to be moved towards each other to grasp the at least one part (38) in the positioning tool (54) and to be moved away from each other to deposit ~~it~~ the at least one part in the positioning receptacle (64) carried by the immobilized pallet (12).

9. (Currently Amended) Apparatus as set forth in claim 5 ~~characterised in that~~ further comprising ~~it comprises~~ centering means (72, 76, 82) adapted to effect precise mutual positioning of the gripper of the manipulator (62) ~~on the one hand~~ with both the positioning tool (54) and ~~on the other hand~~ with the positioning receptacle (64) carried by the immobilized pallet.

10. (Currently Amended) Apparatus as set forth in claim 9 ~~characterised in that~~ wherein the centering means ~~comprise~~ comprises at least two male centering rods (72) carried by the gripper of the manipulator (62) and adapted to engage either into corresponding holes (76) in the positioning tool (54) or

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into corresponding holes ~~(82)~~ in the positioning receptacle ~~(64)~~ carried by the immobilized pallet.

11. (Currently Amended) Apparatus as set forth in claim 10 ~~characterised in that~~ wherein the positioning tool ~~(54)~~ is mounted floatingly on a fixed support ~~(56)~~ by way of elastic means ~~(78)~~.

B/ 12. (Currently Amended) Apparatus as set forth in claim 10 ~~characterised in that~~ wherein the positioning receptacle ~~(64)~~ is mounted floatingly on the pallet ~~(12)~~ by way of elastic means ~~(84)~~.

13. (Currently Amended) Apparatus as set forth in claim 11 or 12 ~~characterised in that~~ wherein the elastic means ~~(78, 84)~~ comprise elastic washers or legs.

14. (Currently Amended) An installation for the circulation of part-carrying pallets comprising ~~characterised in that it comprises~~ a transfer apparatus ~~(14)~~ according to claim 1 arranged to deposit a part ~~(38)~~ on a pallet ~~(12)~~ immobilised at the location of a station ~~(36)~~ of the installation.

[15. (New) An apparatus for transferring at least one part to be deposited on an immobilized pallet, comprising:

a transporter equipped with a gripping device and adapted to grasp the at least one part on a distributor, displace it from the distributor and deposit it in a positioning tool; and

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a manipulator equipped with a gripper and adapted to grasp the at least one part in a precise position in the positioning tool, displace it from the positioning tool and deposit it in a precise position in a positioning receptacle carried by the immobilized pallet, wherein the manipulator is connected to operational control means for effecting:

moving the gripper of the manipulator above the positioning tool;

actuating the gripper of the manipulator to pick up the at least one part in said positioning tool;

horizontally pivoting the support arm over a limited angular range;

displacing the support arm vertically without a change to its angular orientation to move the gripper of the manipulator above the positioning receptacle carried by the immobilized pallet;

actuating the gripper of the manipulator to deposit the at least one part in said positioning receptacle; and

moving the gripper again above the positioning tool for a fresh sequence of operations.
